Remarks

The Section 102(b) Rejection of Claims 13, 14, and 17-20

The Examiner rejected Claims 13, 14, and 17-20 under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 5,537,247 (Xiao). To the extent that the rejection may apply to amended Claims 13, 14, 17-20, and new Claim 31, applicant respectfully traverses this rejection and requests reconsideration.

Claims 13 and 31 both recite, "dispersion means for spectrally fanning out an incoming light beam in a detection beam path of a confocal microscope, wherein said fanned out beam defines a dispersion plane." As taught by the specification of the present invention, this element comprises an optical element that refracts light of different wavelengths at different angles. Thus, when a beam comprising multiple wavelengths enters this element, it is spread out into a "fan" with each wavelength exiting at a different angle. This "spectral fanning out" is shown in Figures 1-3. As shown in the figures, a prism is one means for spectrally fanning out a beam according to the present invention. However, other means for spectrally fanning out a beam are possible and within the spirit and scope of the claims.

The Examiner has cited Xiao as teaching dispersion means for spectrally fanning out a beam. The Applicant respectfully disagrees with the Examiner's characterization of Xiao. There is no teaching that scanner 60, or any other component in the device disclosed by Xiao, acts to fan out the incoming beam based on the wavelength of the incoming light. Figure 6 shows a beam 84 comprising multiple wavelengths incident on beam splitters 42 and 43. "Thus, when portions of object 70 are coated or injected with one or more fluorescent material, incident light from image reflector plates 62 and 63 traveling toward object 70 may have wavelength of 488 nm, but the return fluorescent light from the object 70 may have a wavelength of, for example,

520-560 nm. If different fluorescent materials were used on the same object 70, the returning fluorescent light will possess the wavelengths for each of the fluorescent materials." Column 6, lines 10-18. There is no teaching that this incident beam is "spectrally fanned out," as in the present invention. Dichroic mirror 42 acts to divide the incident beam into two beams of different spectral composition. Column 8, lines 21-22. The device in Xiao then uses filters 45 and 46 to control the range of wavelengths that are incident on detectors 21 and 22. Column 8, lines 27-34. In one embodiment, filter 45 only allows light with wavelengths in the range of 520-560 nm to pass. Filter 46 only allows light with wavelengths above 580 nm to pass. Column 5, lines 51-53. This allows detectors 21 and 22 to detect light from a limited range of wavelengths. Column 8, lines 33-34. This is very different from the present invention. The filters 45 and 46 would not be necessary in the device disclosed by Xiao if the beam were spectrally fanned out. (Filters analogous to filters 45 and 46 are not used in the present invention.) Detectors 21 and 22 could be arranged to receive light contained in a range of angles of the incoming beam, as shown in Figure 3 of the present invention. Xiao needs the dichroic mirrors and filters to divide the incident beam into ranges of wavelengths, because beam 84 comprises multiple wavelengths throughout the incident range of angles. If detectors 21 and 22 were arranged as in the present invention to receive all light from within a range of angles of the incoming beam 84 (Figure 6), detectors 21 and 22 would receive light from the entire range of wavelengths within beam 84. Thus, the element "dispersion means for spectrally fanning out an incoming light beam" is not taught by Xiao.

Since the cited reference does not teach each and every element of either Claims 13 or 31, Claims 13 and 31 are not anticipated by the cited reference.

Claims 14 and 17-20 depend from Claim 13. Since Claim 13 is not anticipated by Xiao, Claims 14 and 17-20 are not anticipated by Xiao.

The Section 103(a) Rejection of Claims 15 and 16

The Examiner rejected Claims 15 and 16 under 35 U.S.C. §103(a) as being obvious in light of U.S. Patent No. 5,537,247 (Xiao) in view of applicant's admission that a triangular passageway is an obvious variant of a rectangular passageway or in view of United States Patent No. 5,973,316 (Ebbesen et al.). Applicant respectfully traverses the rejection.

Claims 15 and 16 depend from amended Claim 13. Since Claim 13 is patentable, Claims 15 and 16 are also patentable.

In view of these differences between the invention as claimed and the art cited by the Examiner, reconsideration of the rejection is respectfully requested.

Conclusion

For all of the reasons outlined above, Applicant respectfully submits that all pending claims are patentable over the cited art and in condition for allowance, which action is courteously requested.

Respectfully submitted,

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MARKED VERSION OF AMENDED CLAIMS

13. [In an] An optical arrangement [for the spectral fanning out of an incoming light beam in the detection path of a confocal microscope for the subsequent splitting of the spectrally fanned out beam out of its dispersion plane and for the detection of the split spectral range, wherein said incoming beam is focused on a pinhole occluder having a passageway, the improvement] comprising:

dispersion means for spectrally fanning out an incoming light beam in a detection beam path of a confocal microscope, wherein said fanned out beam defines a dispersion plane;

means for splitting of the spectrally fanned out beam out of said dispersion plane;

means for detection of a spectral range of said split spectrally fanned out beam; and,

a pinhole occluder having a passageway, wherein said incoming light beam is focused on said pinhole occluder, said passageway being polygonal in configuration.

14. The [improvement according to] optical arrangement recited in claim 13, wherein said passageway is symmetrically configured.

15. The [improvement according to] optical arrangement recited in claim 13, wherein said passageway is triangular in configuration.

16. The [improvement according to] optical arrangement recited in claim 14, wherein said passageway is triangular in configuration.

17. The [improvement according to] optical arrangement recited in claim 13, wherein said passageway is configured with four corners.

18. The [improvement according to] optical arrangement recited in claim 14, wherein said passageway is configured with four corners.

19. The [improvement according to] optical arrangement recited in claim 17, wherein said passageway is rectangular in configuration.

20. The [improvement according to] optical arrangement recited in claim 18, wherein said passageway is rectangular in configuration.